GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Agent systems, PG_00045385		
Field of study	Data Engineering, Data Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Computer Architecture -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Paweł Kozyra	
	Teachers	dr Paweł Kozyra	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	15.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	6.0	64.0	100

Subject objectives

The aim of the course is introduction to theory and practice of agent methodology in distributed systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W01] identifies conditioning of the processes occurring in the analyzed systems and selects methods for solving them, using the accumulated knowledge and taking into account the mutual relations between the analyzed phenomena	Student knows various approaches to constructing internal agent's architecture and can pick an appropriate one concidering agent's mission and anvironment.	[SW1] Assessment of factual knowledge
[K6_U01] analyzes and evaluates complex processes in the context of their improvement possibilities, using various methods, including analytical and simulation	Student knows various methods of complex task decomposition and is able to apply them.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
[K6_U04] formulates logical solutions to complex or unstructured problems	Student prepares a project of an multiagent system, including elements of agent-to-agent cooperation.	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Explanation of criteria to successfully complete the course
2. Introduction to scope of the lecture and issues in multiagent systems
3. Definitions of agent and agent environment
4. Agent models and architectures
5. BDI agent properties
6. Rules of agent interactions
7. Agent algorithm properties
8. Agent search algorithms
9. Agent recommendation algorithms
10. Agent negotiation algorithms
11. Agent application structure
12. Lifecycle of agent application
13. Using services in an agent application
14. Agent development environments
15. Agent runtime environments
16. Examples of agent applications
17. Tests and exams

Course content – project
The goal of the project is to implement and test a multi-agent system to estimate the reliability of a time-constrained multi-state flow network with correlated faults and non-integer capacities.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>A basic knowledge of the Java programming language, as well as command line access to Linux helps.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>written test</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>practical exercises</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. Woolridge Michael: An Introduction to Multiagent Systems.
2. Weiss Gerhard (Ed.): Multiagent Systems - A Modern Approach to Distributed Artificial Intelligence.</td></tr>
<tr><td>Supplementary literature</td><td>1. JADE - Users Guide (*)
2. JADE - Administrator Guide (*)

(*) applies to hands-on exercises</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Implement a mobile agent with given functionality.
Implement an agent service and publish it in the agent's environment.
Describe the use of ontologies in agent environments.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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